**REMARKS**

Claims 1-12 were pending in the present application. Claims 13-16 are added herein. Thus claims 1-16 are now pending. Reconsideration of the present application in view of the above amendments and the following remarks is respectfully requested.

Applicant notes with appreciation the acknowledgement of the claim for priority under section 119 and the notice that all of the certified copies of the priority documents have been received.

Applicant also notes that minor changes have been made to the specification to place the specification in better form. These changes add no new matter.

Applicant further notes that claims 1-4, 7-9 and 11 have been amended herein to correct minor noted grammatical deficiencies and to otherwise place the claims in better form and not for reasons related to the rejections appearing below or for any reasons related to patentability.

Claim 1 stands rejected under 35 USC 102(b) as being allegedly anticipated by U.S. Patent No. 6,232,752 to Bissell (Bissell). This rejection is traversed for the following reasons.

In support of the above rejection, the Examiner asserts that Bissell discloses features of the claimed invention according to claim 1. However, contrary to the Examiner's position, Bissell does not disclose a booster circuit for a pre-drive circuit of a brushless DC single-phase motor, but rather discloses a DC/DC converter configured in a buck-boost configuration to provide DC to DC conversion in applications such as battery chargers. The Examiner apparently equates elements (L10 and L11 in FIG. 6 and 40, 49 in FIG. 8) in Bissell to a motor coil. However, these elements are not part of a motor winding, but rather are inductors that are series current elements on the input and output respectively of the converter and are described in many embodiments as capable of being wound together, e.g. as a transformer.

Paragraph 21 on page 6 of the present application describes the disadvantages of using transformers in booster circuits. The use of transformers is described as disadvantageous due to size and cost. Applicant submits that, at best, Bissell describes a boost portion of a buck boost circuit using a transformer. Bissell however clearly *does not* teach a synchronous motor drive circuit or a booster circuit for a synchronous motor drive circuit.

The boost circuit of the present invention works in connection with a drive circuit having elements configured to drive the motor winding of a DC synchronous motor, and, using voltages associated with different sides of the motor winding, provide boost in a manner designed to address specific deficiencies of the prior art. The present invention as recited in claim 1 therefore differs from the buck-boost circuit described in Bissell for the following reasons.

Claim 1 recites *inter alia* that the drive circuit includes two pairs of serially connected main switching elements such as, for example, a first pair PF1, PF3 and a second pair PF2, PF4. However, Bissell teaches the use of only two switching elements (See FIG. 8: 42, 47) that are not serially connected.

Claim 1 further recites a motor coil interconnected between pair junctions of the serially connected main switching elements. As already discussed above, the coils shown, for example, in FIG. 8 of Bissell are inductors 40, 49, which are used as components in the disclosed buck-boost circuit and are not motor coils as apparently asserted by the Examiner on page 2 of the Office Action.

Claim 1 also recites that the pre-drive circuit provides ON/OFF power flow control to the motor coil. Bissell does not teach such a feature. Rather, Bissell describes a circuit that provides ON/OFF control to control current flow through the inductors 40, 49. The inductors 40, 49 are charged when the switches 42, 47 are closed, and are discharged through diodes when the switches are open. The inductor 40 acts as a voltage boost converter, while the inductor 49 acts

as a voltage buck converter. Put another way, the circuit in Bissell not only acts as a voltage booster circuit, but also as a voltage reduction circuit. (See, for example, col. 3, lines 17-28.)

Further, claim 1 recites that the booster circuit provides a control voltage that exceeds a power supply voltage to turn ON each of the two pairs of serially connected main switching elements of the drive circuit at the direct current power supply side. Bissell describes a drive signal produced by the control circuit to activate the switches. However, Bissell does not teach that the drive signal voltage level is higher than the input voltage. See col. 6, lines 47-56. In fact, FIG. 7 teaches that the voltage level of the drive signal may be lower, not higher, than the input voltage. Further, switches S1 and S2 (FIG. 6) and switches 42, 47 (FIG. 8) are not main switching elements as asserted by the Examiner, but are merely boost control switches of a booster circuit.

Regarding recitation in claim 1 of a booster circuit including a first boost control switching element that turns ON when a first end side of the motor coil reaches a higher electric potential than another end side of the motor coil and charges a first capacitor from the direct current power supply via a first diode, Bissell does not teach such a feature. Rather, Bissell teaches that the capacitor 45 is charged by the input voltage input through the inductor 40 when both switches are open (OFF condition). In addition, switch 40 (S1) turns ON or OFF based on a PWM signal generated by a controller circuit and therefore is not dependent on electric potentials at the terminals of the inductor (40 or L10; characterized by the Examiner as a motor coil). See, for example, col. 5, lines 63-67 and col. 6, lines 62-65.

Bissell also does not teach a second boost control switching element that turns ON when the another end side of the motor coil reaches a higher electric potential than the first end side of the motor coil and conducts electricity between a terminal at a side of a connection between the first boost control switching element and the first capacitor and the direct current power supply

to increase the electric potential at a side of a junction of the first capacitor and the first diode. Rather, Bissell teaches that switch 47 (S2) turns ON or OFF based on the above discussed PWM signal and not based on the electric potentials at the terminals of the inductor (49 or L11; characterized by the Examiner as a motor coil).

Claim 1 also recites a second capacitor that receives an electric charge and is charged from the first capacitor via a second diode when the second boost control switching element turns ON and is connected between said second diode and a switch terminal at the direct current power supply side of the second boost control switching element. Put another way, the first capacitor charges the second capacitor. Bissell instead teaches that the capacitor 50 (C11) is charged by the inductor 49 (L11) when the second switch is opened. See col. 6, line 62 – col. 7, line 2. Specifically, the booster circuit in Bissell boosts (or reduces) an output voltage primarily through the charging/discharging of the inductors 40, 49 (L10, L11), which are charged and discharged independently of one another. For example, the inductor 49 is not charged by the inductor 40, and vice versa.

Finally, claim 1 recites that a boost output voltage is obtained from a connection path between the second diode and the second capacitor. However, Bissell teaches a boost output voltage obtained from a connection path between diode 48 (D14) and transistor/switch 47 (S2).

In view of the numerous fundamental differences between Bissell and the present invention discussed above, a *prima facie* case of anticipation has not been properly established. It is respectfully requested that the rejection of claim 1 be reconsidered and withdrawn.

Claims 3, 5 and 7 stand rejected under 35 USC 103(a) as being unpatentable over Bissell. The rejection is respectfully traversed.

Applicant notes that, by virtue of depending from claim 1, claims 3, 5 and 7 are allowable for at least the reasons set forth hereinabove, and as these claims recite additional features of the

present invention that are not taught by Bissell. In particular, Bissell fails to teach or suggest, *inter alia*, the claimed motor winding and the claimed features associated therewith.

Accordingly, it is respectfully submitted that a *prima facie* case of obviousness has not been established in that Bissell fails to teach or suggest all the claimed features. It is respectfully requested that the rejection of claims 3, 5 and 7 be reconsidered and withdrawn.

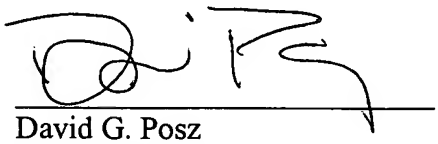
The indication of allowability with regard to claims 2, 4, 6, and 8-12 is noted with appreciation. Applicant reserves the opportunity to rewrite these claims in independent allowable form pending the outcome of further prosecution.

Applicant has submitted new claims 13-16 which are supported by the specification and which claim subject matter similar to claims 1-12. For the general reasons set forth herein above with regard to claim 1, new claims 13-16 are drawn to features not disclosed or taught or suggested in Bissell. Favorable consideration is respectfully requested.

In view of the foregoing, applicant respectfully submits that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the examiner is invited to contact the undersigned by telephone.

Please charge any unforeseen fees that may be due to Deposit Account No. 01-0305.

Respectfully submitted,



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